PROJECT

PLAN

Integrated Procurement System (Case Study)

U.S. Department of Housing and Urban Development

Month, Year

GENERAL INSTRUCTIONS

As the project progresses, the Project Plan should be reviewed and updated as necessary at the end of each of the software development methodology (SDM) phases (i.e., the Initiate Project Phase, the Define System Phase, the Design System Phase, the Build System Phase, the Evaluate System Phase and the Operate System Phase). Documentation should be updated with actual (as opposed to estimated) dates and costs as the acquisition process becomes more defined.

A Lessons Learned Report should also be developed, evaluated and updated (at the end of each phase) and maintained throughout the project lifecycle. This report will serve both as a management review tool and as a problem mitigation tool for the current as well as future projects.

For additional information, refer to the following U.S. Department of Housing and Urban Development (HUD) documents:

- *HUD Systems Development Methodology*
- *HUD SDM Documentation Standards*

TAILORING GUIDELINES

For some projects, it may be necessary to tailor the project plan template. In the event that a section or several sections do not apply, include a statement to indicate that the section or sections do not apply along with a justification statement (e.g., "Sections 1.2 through 1.6 are not applicable to this project. This project does not..."). In the event that the project plan template does not provide coverage for a particular project activity, add a section to the project plan in the appropriate location.

Revision Sheet

Release No.	Date	Revision Description
Rev. 0	1/31/00	SEO&PMD Project Plan
Rev. 1	5/1/00	Project Plan Template and Checklist
Rev. 2	6/13/00	Minor corrections per Office of Administration

Project Plan Authorization Memorandum

I have carefully assessed the Project Plan for the (System Name). This document has been completed in accordance with the requirements of the HUD System Development Methodology.

MANAGEMENT CERTIFICATION - Please check the appropriate statement.

_____ The document is accepted.

_____ The document is accepted pending the changes noted.

_____ The document is not accepted.

We fully accept the changes as needed improvements and authorize initiation of work to proceed. Based on our authority and judgment, the continued operation of this system is authorized.

_____   _____
NAME   DATE
Project Leader

_____   _____
NAME   DATE
Operations Division Director

_____   _____
NAME   DATE
Program Area/Sponsor Representative

_____   _____
NAME   DATE
Program Area/Sponsor Director

PROJECT PLAN

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APPENDICES

1.0   GENERAL INFORMATION

1.0 GENERAL INFORMATION

1.1 Purpose, Scope, and Objectives

In keeping with the Federal Acquisition Streamlining Act (FASA) (1994), the Office of Procurement and Contracts has instituted a formal streamlined procurement and acquisition process. This process is currently supported by a standalone system that automates data collection as well as user interaction and access at various points in the procurement process workflow.   Recent updates to FASA, amendments to the Office Federal Procurement Policy Act (1988), and new Congressional reporting requirements advocate the need for cross-functional integration of procurement activities and an expansion in the scope of data reporting and retention requirements. The functional and technological limitations of the current procurement system articulate the need to replace it with a more technologically and functionally capable application in order to facilitate compliance. The purpose of this project is to develop, implement and deploy an integrated procurement system that will address the above mentioned requirements and facilitate agency compliance. The project aims at correcting the functional and technical deficiencies of the current 5-year-old system

The project is expected to be a 9-month development effort to begin June 1 of the current fiscal year and have a useful technology life of at least 5 years. The project is designed to achieve the following business objectives:

- Automation of the high volume, low-dollar value simplified acquisition business processes performed in all Headquarters and field offices with delegated procurement authority saving the agency over $700,000.00 in processing fees annually.
- Standardization of business processing for over 5,000 annual HUD purchase order transactions for the entire simplified acquisition business cycle of small purchase requisition, solicitation production, purchase order production, and management reporting.
- Dual entry of the small purchase transactions in procurement and financial systems is eliminated by the IPS interface to the Department's central accounting system
- Staff performing simplified acquisitions in more than 25 locations have a standardized and fully automated system for purchase requisition, solicitation and a standardized and fully automated system for purchase requisition, solicitation, award, administration, and reporting.   This is expected to shorten the turnaround time for processing purchase requisition by 50% resulting in improved productivity an annual saving of $325,000.00 in labor expenses.
- Program staff nationwide will be able to enter requests for contract services on-line as well as check status of submitted requests and generate reports.
- The Department will be better able to provide timely and accurate reports on Contracting activities to HUD management the Federal Procurement Data Center (FPDC), Office of Management and Budget within the Executive Office of the President (OMB), Congress, and the public.
- Measurable outcomes include:
  - 95% of simplified acquisition actions are recorded with 3 days of issuance, and

- 90% of completion of summary contract action report for all procurement office locations within 10 days of the completion of each calendar quarter

The scope of this project extends from Project Initiation and Planning through Implementation, Deployment and Training and the first year of systems operations. Systems corrective and adaptive maintenance is excluded from the scope of this project.

1.2   System Overview

The Procurement and Contracting Office at Headquarters and the Regional Administrative Offices are responsible for administering the Department's procurement and acquisition process and are the organizations that will share responsibility for the Integrated Procurement System (IPS). IPS will utilize client server architecture to integrate procurement workflow and will be designed to support web-enabled access. This system is a major application that is designed to support and integrate procurement and acquisition processing activities.

The IPS production environment is described below:

Computing Requirements	Estimated Size	Basis
Personal desktop computer (PC)	CPU: Intel Pentium 133 MHz O/S: Modified MS Windows 95 RAM: 32 MB Local storage: 500 MB	One per User (HUD employee)
Access to SQL Server	500 MB storage	Contractor Team Leader, developers, Procurement System users
Current Procurement System Software access	Icon; 100 bytes storage	Each Procurement System user
Microsoft NT application/database	1 Gig storage	Operating System
LAN Servers	100 MB space on each; 80 MB for application; 20 MB for contingency	Procurement System on production server

1.3   Contacts

The following persons can be contacted with questions pertaining to this document:
- Linda Williams, Project Leader, Office of Procurement and Contracts
- Robert Hawley, Project Leader, Office of Procurement and Contracts
- John Moriani, Configuration Manager, Office of Procurement and Contracts

1.4   Project References

- Federal Acquisition Streamlining Act (FASA) of 1994
- Office of Federal Procurement Policy Act (OFPPA) of 1988
- Government Paperwork Elimination Act (GPEA) of 1998
- Office of Federal Procurement Policy Act Amendments of 1988 (Public Law 100-679)
- HUD System Development Methodology (SDM)
- The current procurement system's Software Quality Assurance Plan
- The current procurement system's Software Configuration Management Plan
- Procedure for Reviewing Project Commitments to External Individuals or Groups with Senior Management

- Procedure for Developing the Software Development Plan
- Procedure for Estimating the Size of the Project Software Work Products
- Procedure for Assessing the Project Critical Computer Resources
- Procedure for Deriving the Project Schedule
- Procedure for Revising the Software Development Plan
- Procedure for Reviewing External Project Commitments and Changes to Commitments with Senior Management
- Powerscript Coding Standards and Naming Conventions

1.5 Relationship to Other Projects

The project will interface with the agency's general ledger and financial account systems as well as the new Web Access Security Subsystem (WASS). The Office of the Chief Financial Officer is currently updating data standards and other requirements for recording financial data. The integrated procurement system will source this system with data pertaining to contract obligations and actions and as will be impacted by these standards. In addition, the successful implementation of IPS web-enabled capabilities for remote data access, retrieval and other online functions will be contingent on the successful deployment of the WASS.

1.6 Organization Interfaces

The following organizations must perform the following activities to ensure the successful development and deployment of the new IPS system:

- Office of Procurement and Contracts (OPC) (Headquarters and 25 Field Offices)
- Office of Information Technology (OIT)
- OPC Contractors

Organization	Coordination Activities	Associated Schedule
OPC	Planning, Project Management	03/07/FY00 – 02/28/FY01
OPC, OPC Contractors	Business Requirements Support, Systems Requirements Support	06/10/FY00 – 07/10/FY00
OPC Contractors	Systems Design and Analysis	06/30/FY00 – 08/30/FY00
OIT, OPC, OPC Contractors	Hardware/Software Acquisition and Integration	06/30/FY00 – 08/15/FY00
OPC Contractors	Development, Development Coordination	08/15/FY00 – 12/31/FY01
OIT, OPC Contractors	System Integration and Testing	01/01/FY01 – 02/01/FY01
OPC Contractors, OIT	Installation, Deployment and Training	02/01/FY01 – 02/28/FY01

1.7 Acronyms and Abbreviations

Acronym/Abbreviation	Definition
CM	Configuration Management
OPC	The Office of Procurement and Contracts.
FAD	Field Accounting Division.
FOIA	Freedom of Information Act.
FPDC	The Federal Procurement Data Center.
FPDS	The Federal Procurement Data System maintained by the FPDC.
FRD	Functional Requirements Document.
GAO	General Accounting Office
Government	U. S. Government or Federal Government unless otherwise indicated.
GSA	General Services Administration
GTM	Government Technical Monitor.
GTR	Government Technical Representative.
IPS	Integrated Procurement System
JFMIP	Joint Financial Management Improvement Program
GUI	Graphical User Interface.
OFPP	Office of Federal Procurement Policy within OMB.
OIG	Office of Inspector General
OIT	Office of Information Technology.
OMB	Office of Management and Budget within the Executive Office of the President.
Program Office	The Office within the Department that initiates and has primary responsibility for, or interest in, a Procurement of property or services.
SQL	Structure Query Language.
QA	Quality Assurance
SDM	System Development Methodology.
RAD	Rapid Application Development.
WBS	Work breakdown structure.

2.0 PLANNED ACTIVITIES, EVENTS, AND DELIVERABLES

2.0 PLANNED ACTIVITIES, EVENTS, AND DELIVERABLES

A. PROJECT INITIATION/PLANNING

1.1.1 Schedule Project			
Planned Start Date	**03/07/FY00**	Duration	**3 months**
Actual Start Date			
Planned End Date	**06/07/FY00**		
Actual End Date		Variance	
Deliverables	• IPS Project Schedule *(due 2 weeks from start date)* • IPS Work Breakdown Structure *(due 2 weeks from start date)*		
Resources	Project Manager , Task Leader, Project Coordinator, Project Leader		

B. REQUIREMENTS DEFINITION

2.1.1 Identify Requirements			
Planned Start Date	**06/10/FY00**	Duration	**1 month**
Actual Start Date			
Planned End Date	**07/10/FY00**		
Actual End Date		Variance	
Deliverables	• IPS Functional Requirements Document (FRD) *(due 1 week from end date)* • System Support and Acquisition Plan • Data Requirements Document • System Security and Privacy Plan		
Resources	Project Leader, Task Leader, Bus. Analyst. Analysts, Sr. Systems Analyst		

C. SYSTEMS DESIGN

3.1.1 Identify, Analyze and Design Objects			
Planned Start Date	**06/30/FY00**	Duration	**1 month**
Actual Start Date			
Planned End Date	**07/30/FY00**		
Actual End Date		Variance	
Deliverables	• Object Definition Documents *(due 1 week from end date)*		
Resources	• Project Leader, Sr. Prog. Analysts, DBA, Data Modeler, Bus. Analysts		
3.1.2 Analyze Data			
Planned Start Date	**06/30/FY00**	Duration	**2 months**
Actual Start Date			
Planned End Date	**08/30/FY00**		
Actual End Date		Variance	
Deliverables	• Data Analysis Document *(due 1 week from end date)*		
Resources	Project Leader, Sr. Prog. Analysts, DBA, Data Modeler, Bus. Analysts		

3.1.3 Design Database			
Planned Start Date	**06/30/FY00**	Duration	**2 months**
Actual Start Date			
Planned End Date	**08/30/FY00**		
Actual End Date		Variance	
Deliverables	• Data Analysis Document *(due 1 week from end date)*		
Resources	Project Leader, Sr. Prog. Analysts, DBA, Data Modeler, Bus. Analysts		
3.1.4 Develop System Specification			
Planned Start Date	**07/30/FY00**	Duration	**1 month**
Actual Start Date			
Planned End Date	**08/30/FY00**		
Actual End Date		Variance	
Deliverables	• System Specification Document *(due 1 week from end date)*		
Resources	Project Leader, Sr. Prog. Analysts, DBA, Data Modeler, Bus. Analysts		

D. SOFTWARE ACQUISITION

4.1.1 Purchase Customized Package			
Planned Start Date	**06/30/FY00**	Duration	**6 weeks**
Actual Start Date			
Planned End Date	**07/15/FY00**		
Actual End Date		Variance	
Deliverables	• Customized Procurement Package		
Resources	Task Leader, Proj. Manager, Sr. Prog. Analyst(s),		
4.1.2 Purchase Licenses and Development Tools			
Planned Start Date	**07/30/FY00**	Duration	**6 weeks**
Actual Start Date			
Planned End Date	**08/15/FY00**		
Actual End Date		Variance	
Deliverables	• Desktop Software (Notes Client, Powerbuilder, MS Office)		
Resources	Task Leader, Proj. Manager, Sr. Prog. Analyst(s),		

E. HARDWARE ACQUISITION

5.1.1 Purchase Development Servers			
Planned Start Date	**06/30/FY00**	Duration	**6 weeks**
Actual Start Date			
Planned End Date	**07/15/FY00**		
Actual End Date		Variance	
Deliverables	• Access to SQL Servers		
Resources	Proj. Manager, Project Leader, Configuration Mgr., DBA		

F. NEW DEVELOPMENT/UNIT TESTING/DOCUMENTATION

6.1.1 Prototype System			
Planned Start Date	**08/15/FY00**	Duration	**2 weeks**
Actual Start Date			
Planned End Date	**08/30/FY00**		
Actual End Date		Variance	
Deliverables	• Updated System Specification Documentation *(due 1 week from end date)*		
Resources	Project Leader, Task Leader, Team Leader , Sr. Systems Analyst, Sr. Prog. Analysts, Prog. Analyst, Data Modeler, Technical Writer		
6.1.2 Develop System			
Planned Start Date	**09/01/FY00**	Duration	**4 months**
Actual Start Date			
Planned End Date	**12/31/FY01**		
Actual End Date		Variance	
Deliverables	• Updated System Specification Documentation *(due 1 week from end date)* • Updated FRD *(due 1 week from end date)*		
Resources	Project Leader, Task Leader, Team Leader , Sr. Systems Analyst, Sr. Prog. Analysts, Prog. Analyst, Data Modeler, Technical Writer		

G. SYSTEM INTEGRATION AND TESTING

7.1.1 Conduct Verification and Validation Testing			
Planned Start Date	**01/01/FY01**	Duration	**1 month**
Actual Start Date			
Planned End Date	**02/01/FY01**		
Actual End Date		Variance	
Deliverables	• IPS Verification and Validation Test Plan *(due 1 week from start date)* • Test Results and Evaluation Report (System Test) • Test Results and Evaluation Report (Integration Test)		
Resources	Team Leader, Sr. Systems Analyst, Sr. Prog. Analysts, Config. Manager		

H. INSTALLATION, DEPLOYMENT AND TRAINING

8.1.1 Document and Deploy System			
Planned Start Date	**02/01/FY01**	Duration	**1 month**
Actual Start Date			
Planned End Date	**02/28/FY01**		
Actual End Date		Variance	
Deliverables	• IPS User Guide *(due 1 week from end date)*		
Resources	Team Leader, Sr. Systems Analyst, Sr. Prog. Analysts, Config. Manager, DBA		
8.1.2 Conduct Training			
Planned Start Date	**01/15/FY01**	Duration	**6 weeks**
Actual Start Date			

Planned End Date	**02/28/FY01**		
Actual End Date		Variance	
Deliverables	• IPS Training Manual *(due 1 week from end date)*		
Resources	Team Leader, Sr. Systems Analyst, Sr. Prog. Analysts, Config. Manager, DBA		

I. OPERATE SYSTEM

9.1.1 Put System Into Production			
Planned Start Date	**03/01/FY01**	Duration	**4 weeks**
Actual Start Date			
Planned End Date	**04/01/FY01**		
Actual End Date		Variance	
Deliverables			
Resources	Team Leader, Sr. Systems Analyst, Sr. Prog. Analysts, Config. Manager, DBA		

3.0   RESOURCES

3.0   RESOURCES

3.1   Roles and Responsibilities

Team Member Role and Labor Category	Responsibilities
Mary Hemmings Project Coordinator Labor Category: Senior Task Manager 4 Contractor	- monitor and manage the overall status of the project - assign responsibility for specific work products and tasks - interface with client to discuss project requirements and schedules - produce Project Management deliverables - validate that all work is performed in accordance with SDM guidelines - quality assurance - develop the software development plan - negotiate project commitments - assist in analyzing the user requirements - user support of all the systems - facilitate user assistance
Peter Samuel Team Leader/Business Analyst Sr. Technical Consultant 3A Contractor	- lead the development team - assist in designing, developing and implementing the work products - develop, analyze and manage user requirements - assist in developing and updating all SDM documents - develop stored procedures on SQL server - maintain SQL database for - assist Task Leader in managing the project - assign responsibility for specific work products and tasks - provide technical support for - quality assurance
Gavaskar Vengesum Programmer/Analyst Journeyman Programmer Analyst 4 Contractor	- assist in analyzing, designing, developing and implementing - provide technical and user support for - perform system testing -
Parvesian Parveen/ Task Leader/Sr. Programmer/ Analyst Technical Consultant SA Contractor	- assist in analyzing, designing, developing and implementing - provide technical and user support for - perform system testing

Team Member Role and Labor Category	Responsibilities
Venesh Vonteru Sr. Programmer/Analyst Sr. Technical Consultant 2 Contractor	- assist in analyzing, designing, developing and implementing - provide technical and user support for - perform system testing
Lucy Lou Sr. Programmer/ Analyst Sr. Technical Consultant 2 Contractor	- assist in analyzing, designing, developing and implementing - provide technical and user support for - perform system testing
Veronica De Forester Programmer/Analyst FTE	- assist in analyzing, designing, developing and implementing - provide technical and user support for - perform system testing
Terry Patton Sr. Programmer/Analyst FTE	- assist in analyzing, designing, developing and implementing - assist in analyzing user requirements - assist in conducting unit testing - provide technical and user support for - assist in developing and updating test plans - perform system testing
Sharon Malaysia Sharon Programmer/Analyst FTE	- assist in analyzing, designing, developing and implementing - assist in analyzing user requirements - assist in conducting unit testing - assist in developing and updating test plans - provide technical and user support for - perform system testing
Pawtan Dhir Sr. Systems Analyst Sr. Technical Consultant 2A Contractor	- analyze project procedures - write project procedures - analyze system errors, recommend fixes - recommend system improvements - quality assurance - provide assistance to develop and update documents for - assist in development of the Software Development Plan - perform system testing

Team Member Role and Labor Category	Responsibilities
Jean Bonner Technical Writer/Analyst Technical Writer 3A Contractor	- develop and update all the documents in accordance with SDM guidelines including User Manual for - assist in developing and updating the FRD, System Specs, Program Specs, and Database Specs - assist in developing and updating the System Test Plan and User's Manual - assist in analyzing user requirements - assist in analyzing, designing, developing and implementing - develop and update the documents for - perform system testing
John Moriani Configuration Manager Principal Tech. Consultant Contractor	- ensure compliance to the SDM guidelines - audit project to ensure compliance - maintain configuration control for project deliverables
Stephanie Colin Project Leader FTE	- ensure compliance to SDM guidelines - audit project to ensure compliance - maintain configuration control for project deliverables

3.2 Labor Categories and Estimated Cost for Each Labor Category

The following table also provides information required for Section 3.3.1

Category	Rate	No. Resources	Est. Hours	Est. Cost
Senior Tech Consult lA	75.00			
Senior Tech Consult 2A	65.00	1	1400	$ 91,000.00
Senior Task Manager 4	75.00	1	200	$ 15,000.00
Project Director V	80.00			
Principal Tech Consultant	85.00	2	1,945	$165,325.00
Sr. Technical Consultant 3A	60.00	1	780	$ 46,800.00
Tech Consultant 6	55.00			
Journeyman Programmer Analyst 4	45.00	1	400	$ 18,000.00
Tech Consultant SA	50.00	1	690	$ 34,500.00
Tech Writer 3A	40.00	1	300	$ 12,000.00
Data Base Administrator	90.00			
Sr. Technical Consultant 2	60.00	1	800	$ 48,000.00

3.3 Budget Estimates and Total Costs

3.3.2 Estimates and Costs for Capital Investments

Required Computing Resources	Estimated Cost	Basis	Total Cost
Personal desktop computer (PC)	6 @ $1,200	Each team member	$7,200

3.3.3 Estimates and Costs for Equipment Rental

This is not applicable. The development of IPS does not require the use of rental equipment.

3.3.4 Estimates and Costs for COTS Software

Required Computing Resources	Estimated Cost	Basis	Total Cost
Access to server at contractor's site	N/A	Each team member	
MS Office for Windows 95	$819	Each team member	$819
MS Project 2000	$372	Task Leader	$372
PowerBuilder/Pro 7.0	$1500	Team Leader, developers (4 Licenses)	$1500
Lotus Notes client	6 @ $75	Each team member	$450
PowerDesign		Team Leader, developers	
PVCS v. 6.0.00 Build 10b	$713	Configuration Manager	$713
RoboHelp 7.0	$699	Technical Writers	$699
Rational Test w/ Robot	$5000	Developers	$5000
Customizable Procurement Package	$25,000	Developers	$25,000
Access to SQL Server 6.5	N/A	Team Leader, developers	
Estimated Total Cost $41,753			

3.3.5 Estimates and Costs for Operating Costs

Estimated Operating Costs for Travel: $6,300

3.3.6 Estimates and Costs for Government Services

This is not applicable. The development of IPS does not require the use of Government Services.

4.0 TECHNICAL APPROACH

4.0   TECHNICAL APPROACH

4.1   Methods and Techniques

The HUD System Development Methodology (SDM) will be used as a guide in planning and developing IPS. The IPS development team will apply the Rapid Application Development (RAD) to schedule and perform the systems development tasks. The system development tasks will reflect the SDM project life cycle phases. The IPS development rating strategy will include the practice of phase containment. Responsibilities for project tasks will be clearly identified, and project teams will be assigned to each task. The following paragraph provides a description of the phase containment approach to IT project systems development.

Phase containment is a process used to track, measure, and contain errors in the system development process. The term "phase containment" refers to the concept of containing defects within each phase of the systems development cycle. Since defects identified during later phases of the project are exponentially more expensive to fix, phase containment aims to contain defects within their originating phase and to prevent them from being passed on to subsequent phases. Deliverables will be delivered in phases and approved before the next phase can be completed.

Release Phase Overview

The following paragraphs explain the HUD SDM phases that IPS will utilize during the development cycle in FY00.

Initiate Phase

This phase is the period in which an information management need is identified and the decision is made whether to commit the necessary resources to solve the deficiency. After the need has been identified, documented and approved project planning begins. During this phase, the following tasks are performed:

- Define Need
- Perform needs assessment and document results
- Develop Project Plan
- Create Project Schedule
- Develop Risk Mitigation Plan

The deliverables for this phase include a project schedule and associated work breakdown structure (WBS).

Define Phase

This phase expands system objectives into specific, detailed functional and data requirements, which then form the basis for the detailed design of the system during the System Design phase. At the end of the Requirements Definition phase, a detailed Functional Requirements Document is completed which is a

detailed description of the system functions and their applicability to the process business rules. During the Requirements Definition phase, the user's information management need is translated into the functional requirements for the system. The deliverables for this phase include:

- System Support and Acquisition Plan
- Functional Requirements Document
- Data Requirements Document
- System Security and Privacy Plan

Design Phase

This phase is to develop detailed system, data, and program specifications that emphasize the physical solution to the user's information management need as described in the Functional Requirements Document (FRD). The functional and data requirements from the Requirements Definition phase are further refined to low-level specifications (system/subsystem, program, and database). The specifications are then organized in a way suitable for implementation within the constraints of a physical environment (e.g., computer, database, and facilities). Additionally, the system and integration test plan and the training plan are completed during this phase. The deliverables for this phase include:

- System/Subsystem Specifications
- Database Specifications
- Program Specifications
- Validation, Verification and Testing Plan
- Training Plan

Build Phase

This phase of system development is where the programmers take the deliverables from the Design Phase, transform them into machine-executable form, and ensure that all of the individual components of the system function correctly and interface properly with other components within the system. The deliverables for this phase include:

- Installation and Conversion Plan
- Test Plan (Unit)
- User's Manual
- Operations Manual
- Maintenance Manual

Evaluate Phase

The following paragraphs will include an explanation of the system, integration, and user acceptance test efforts that are contained within the evaluate phase of a system release.

System and Integration Tests

This phase is when the system undergoes complete and thorough System and Integration Tests conducted by a test team using the original system requirements. During this phase the testers measure the system's ability to perform the functions that are required by the user and ensure an acceptable level of performance. After this phase of development is completed, a clear indication of the system's readiness for operation is evident. System and Integration Tests verify and validate that the application accurately addresses the requirements defined in the Define Phase and Design Phase deliverables. In addition, these tests ensure that user manuals and operators manuals along with other pertinent documents reflect changes made as a result of testing. The deliverables for this phase include:

- Test Results and Evaluation Report (System Test)
- Test Results and Evaluation Report (Integration Test)

User Acceptance Test

This phase consists of executing a complete and thorough User Acceptance Test conducted by the actual business users of the system. During this phase the business users measure the system's ability to perform the functions that are required to fulfill the business task which was automated and ensure an acceptable level of performance. User Acceptance Test verifies and validates that the application accurately addresses the requirements defined in the Define Phase deliverables from the business user's perspective. As minor changes and problems appear during testing, the development staff is available to provide support such as code fixes and changes by the programmers. After this phase of development is completed, the Project Sponsor approves the system for implementation into the production environment. The deliverable for this phase includes:

- Test Results and Evaluation Report (System Test)

Operate Phase

In this phase, the system is prepared for implementation into the production environment and training of users is executed. During this phase, the development and training teams perform the following activities:

- Implement the necessary changes to convert the application from the test environment to production
- Execute implementation of the application into production
- Finalize and Deliver User Guide(s)
- Conduct Planned Training

4.2   Environment

Describe the software engineering environment chosen for the project. Provide explanations of the hardware, operating system, compilation systems, and CASE tools used to support the project.

IPS development and production environments will comprise a multi-tier client/server architecture that utilizes microcomputer, desktop, server, database and network communications technologies. This architecture separates data maintenance, business rules, and data presentation among two distinct entities, the client (the User's workstation) and the server (database server). The software application will be developed using PowerBuilder/Pro 7.0. The database server is a Microsoft's Structured Query Language (SQL) Server. The procurement system will request services from the database server, provide the graphical user interface (GUI), process data, and validates data prior to sending the data to the database server for processing. The database server will communicate with the procurement system via a message-based protocol system requesting data. The server will provide centralized data management and will support multitasking, data archiving, and complex query and workload management.

The system will share servers and LAN/WAN connectivity with other Agency systems in secured space as part of the overall Departmental computer operations support environment. The application and database will reside on three Microsoft NT servers located remotely at the Department's Computer Center in Lanham, MD. One server will serve as the operations server, one will be used for development and one used for testing. The Department owns the servers that are managed and operated by a contractor staff . The application will reside on each LAN server that is located on the Department's WAN. All users must access the procurement system's database at the Computer Center in Lanham, MD. Remote locations will be linked via local servers to systems database located at the Lanham facility.

APPENDIX A   PROJECT SCHEDULE

The following is a high level project schedule (using HUD standard Work Breakdown Structure (WBS)) for the lifecycle of IPS development and deployment activities during FY00 through FY01.

WBS ID	Planned Task	Planned Start Date	Planned End Date
1.0	**Initiate/Plan Project**	**03/07/00**	**06/07/00**
1.1.1	Schedule Project	03/07/00	06/07/00
2.0	**Define Requirements**	**06/10/00**	**07/10/00**
2.1.1	Identify Requirements	06/10/00	07/10/00
3.0	**Design System**	**06/30/00**	**08/30/00**
3.1.1	Identify, Analyze and Design Objects	06/30/00	07/30/00
3.1.2	Analyze Data	06/30/00	08/30/00
3.1.3	Design Database	06/30/00	08/30/00
3.1.4	Develop System Specification	07.30/00	08/30/00
4.0	**Acquire Software**	**06/30/00**	**08/15/00**
4.1.1	Purchase Customizable Software Package	06/30/00	07/15/00
4.1.2	Purchase Licenses and Dev. Tools	07/30/00	08/15/00
5.0	**Acquire Hardware**	**06/30/00**	**07/15/00**
5.1.1	Purchase Development Servers	06/30/00	07/15/00
6.0	**Develop, Test and Document System**	**08/15/00**	**12/31/00**
6.1.1	Prototype Model of System	08/15/00	08/30/00
6.1.2	Develop System	09/01/00	12/31/00
7.0	**Integrate and Testing System**	**01/01/01**	**02/01/01**
7.1.1	Conduct Verification and Validation Testing	01/01/01	02/01/01
8.0	**Install, Deploy and Train**	**01/15/01**	**02/28/01**
8.1.1	Document and Deploy System	02/01/01	02/28/01
8.1.2	Conduct Training	01/15/01	02/28/01
9.0	**Operate System**	**03/01/01**	**04/01/01**
9.1.1	Put System Into Production	03/01/01	04/01/01

APPENDIX B   LESSONS LEARNED REPORT OUTLINE

TO BE PROVIDED BY EACH PROJECT

Lessons Learned that will be applied to this project:

- Conduct regular project milestone meetings
- Create minutes to document meeting actions and next steps
- Document all weekly status of all deliverables
- Document project issues and communicate regularly with Project Sponsors
- Adhere to phase containment strategy. Use as a tool to manage project "scope screep"
- Review/update Project Plan and Risk Management plans regularly
- Assess performance variances regularly